# Thermal Diffusivity of Ni - Si Alloys in the Vicinity of the Melting Point

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Thermal diffusivity (a) of solid solutions of Si in Ni in the temperature range 1400 - 1800 K was studied. Measurements were made with the flash method by using a sample in the shape of a drop. Such a shape of the sample was stimulated by a need to minimize the change in its form during melting. The basis of the theoretical calculations is a numerical method of describing nonstationary three-dimensional heat flow equation for samples of ellipsoidal shape under the influence of a laser pulse. Using a flash method for the experiment was done because of its rapidity and relative simplicity. The value of the thermal diffusivity is defined as the time of occurance of half of the maximum value of the temperature. A heat pulse from the laser acts on the upper part of the sample. The temperature signal was obtained by the photosensor, then processed through a preliminary and scaling amplifier and entered ADC, where it was digitatized; this signal was recorded in the computer. Such a method of study has allowed us to produce measurements of the thermal diffusivity of the same sample in two conditions (solid and liquid). Experimental anomalies were discovered in the dependence of the thermal diffusivity in the vicinity of the melting point. This anomaly is observed as a jump a(solid)/a(liquid) > 1. With increasing Si concentrations in Ni, the value of the jump decreases.